

CLAIMS

What is claimed is:

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1. A method for providing a ground strap on a semiconductor device comprising
the steps of:
3 (a) providing a substrate region;
4 (b) providing an epitaxial (EPI) layer over the substrate region;
5 (c) etching a plurality of device structures in the EPI layer;
6 (d) providing a slot in the semiconductor substrate that is in contact with the
substrate region;
7 (e) oxidizing the slot except at the bottom of the slot; and
8 (f) providing a metal within the slot.

1 2. The method of claim 1 wherein the metal providing step (f) comprises the step
of:
3 (f1) filling the slot utilizing a metal that is provided on the surface of the EPI
layer that is of a thickness that is one-half the depth or width of the at least one slot.
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1 3. The method of claim 1 wherein the metal comprises a plurality of metals.
1 4. The method of claim 3 wherein the plurality of metals comprises two metals, a
2 first metal covers one half the slot depth and a second metal fills the slot.

1 5. The method of claim 4 wherein the plurality of metals comprises three deposited
2 metals, wherein the first and second metal fill the slot, followed by a deposited dielectric,
3 wherein contacts are opened, including those to the second deposited metal and the third metal
4 provides an interconnect layer and contacting metal.

1 6. The method of claim 1 wherein the at least one metal is provided utilizing
2 chemical vapor deposition.

1 7. The method of claim 1 wherein the metal is provided utilizing sputter
2 deposition.

1 8. The method of claim 1 wherein the ground strap comprises an ideal short to
2 ground.

1 9. The method of claim 1 wherein the ground strap provides for isolation between
2 components by means of the oxide that is in the slots except the bottom of the slots where the
3 ground strap makes contact to the ground.

1 10. A semiconductor device comprising:
2 a semiconductor substrate, the semiconductor substrate including a plurality of
3 device structures thereon; and
4 an interconnect on the semiconductor substrate, the interconnect comprising at
5 least one slot provided in the semiconductor substrate and at least one metal within the slot,

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wherein the at least one slot is oxidized everywhere except at the bottom of the slot where the
interconnect forms a ground.

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1 11. The semiconductor device of claim 10 wherein the metal comprises a plurality
2 of metals.

1 12. The semiconductor device of claim 11 wherein the plurality of metals comprises
2 two metals, a first metal covers one-half of the slot and a second metal fills the slot.

1 13. The semiconductor device of claim 12 wherein the plurality of metals comprises
2 three metals, wherein the first and second metals fill the slot and the third metal provides an
3 interconnect layer.

1 14. The semiconductor device of claim 13 wherein the ground strap comprises an
2 ideal short to ground.

1 15. The semiconductor device of claim 14 wherein the ground strap provides for
2 isolation between components.

1 16. A high voltage interconnect on a semiconductor substrate comprising:
2 at least one slot provided in the semiconductor substrate; and
3 at least one metal within the slot, wherein the at least one slot is oxidized
4 everywhere except at the bottom of the slot, and the interconnect forms a very low resistance

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ground strap.

17. The interconnect of claim 16 wherein the metal comprises a plurality of metals.

1 18. The interconnect of claim 17 wherein the plurality of metals comprises two
2 metals, a first metal covers one-half of the slot and a second metal fills the slot.

1 19. The interconnect of claim 16 wherein the plurality of metals comprises three
2 metals, wherein the first and second metals fill the slot and the third metal provides an
3 interconnect layer.

20. The interconnect of claim 16 wherein the ground strap comprises an ideal short to ground.

21. The interconnect of claim 16 wherein the ground strap provides for isolation between components